

CLAIM AMENDMENTS

1. (currently amended) A method of load balancing in a control node ~~an upstream proxy~~, the method comprising:

maintaining a list of downstream proxies, wherein the proxies implement the SIP protocol;

receiving, at ~~[[a]]~~ the control node, ~~Voice over Internet Protocol (VoIP) load~~ information from a plurality of the downstream proxies in the list;

determining ~~the VoIP information including~~ a delay time between the control node and the downstream proxies, wherein the delay time is determined by the control node transmitting an invalid SIP message to each of the downstream proxies in the plurality, the control node receiving a respective SIP response message from each of the downstream proxies in the plurality, and the control node calculating, as the delay time, a difference between the transmission of each invalid SIP message and the receiving of each corresponding SIP response message;

~~monitoring a load on the proxies by querying specific processes of the proxies;~~

assigning a weight to each of the downstream proxies in the list, the weight based in part upon ~~the VoIP information~~ the respective calculated delay time for each downstream proxy; and ~~including the delay time received from the downstream proxies and also in part on a pre-weighting of at least one of the downstream proxies in the list~~

~~wherein the proxies implement the SIP protocol, and~~

distributing a traffic load to one of the plurality of downstream proxies based in part on the weight of each of the downstream proxies.

2-4. (cancelled)

5. (currently amended) The method of claim ~~[[3]]~~ 1, wherein ~~a load for a particular downstream proxy is determined by querying the processes of the downstream proxy~~ the weight assigned to each downstream proxy is also based on a pre-weighting of each downstream proxy.

6. (currently amended) A readable memory device for load balancing, the device comprising:

means for maintaining a list of the plurality of downstream proxies;

means for receiving ~~Voice over Internet Protocol (VoIP)~~ load information from ~~[[a]]~~ each of the plurality of downstream proxies;

means for calculating a delay time between the control node and the downstream proxies, wherein the delay time is determined by the control node transmitting an invalid SIP message to each of the downstream proxies in the plurality, the control node receiving a respective SIP response message from each of the downstream proxies in the plurality, and the control node calculating, as the delay time, a difference between the transmission of each invalid SIP message and the receiving of each corresponding SIP response message;

means for assigning a weight to each of the respective downstream proxies in the list, the weight based in part upon the ~~VoIP~~ load information received from the downstream proxies and also in part on ~~a pre-weighting of at least one of the downstream proxies in the list~~ the calculated delay time between the control node and each respective downstream proxy; and

~~means for implementing the SIP protocol, and~~

means for assigning a load to one of the downstream proxies based in part on the weight of the downstream proxies.

7. (cancelled)

8. (currently amended) A system for providing load balancing, the system comprising:

a plurality of proxies;

a control node coupled to the plurality of proxies, the control node receiving ~~Voice over Internet Protocol (VoIP)~~ load information from each of the plurality of proxies, including and calculating a delay time between the control node and the downstream proxies from the plurality of proxies, wherein the delay time is determined by the control node transmitting an invalid SIP message to each of the proxies in the plurality, the control node receiving a respective SIP response message from each of the proxies in the plurality, and the control node calculating, as the delay time, a difference between the transmission of each invalid SIP message and the receiving of each corresponding SIP response message, maintaining a list of the plurality of proxies, monitoring a load on the proxies by querying specific processes of the proxies and assigning wherein the control node assigns a respective weight to each of the proxies in the list, the weight based upon the ~~VoIP~~ load information and the calculated delay times, received from the proxies and also in part on a pre-weighting of at least one of the downstream proxies in the list; and

~~wherein the proxies implement the SIP protocol, and~~

wherein the control node distributes a traffic load to one of the plurality of ~~downstream~~ proxies based in part on the weight of each of the ~~downstream~~ proxies.

9. (cancelled)

10. (currently amended) A method for assigning weights to a group of proxies, wherein a control node is coupled to the group of proxies and the control node maintains a threshold value, the method comprising the steps of:

sending, from ~~[[a]]~~ the control node, a ~~Voice over Internet Protocol (VoIP)~~ message to each of the proxies;

~~monitoring a load on the proxies by querying specific processes of the proxies;~~

receiving a reply from each of the proxies, wherein each reply is in response to the respective message sent to the proxies;

determining a response time for each of the messages sent to each of the proxies;

assigning a weight to each of the proxies based upon the response time of the message sent to the proxies ~~and also in part on a pre-weighting of at least one of the downstream proxies in the list;~~

~~receiving a message;~~

receiving a new call;

determining a call volume;

if the call volume is below the threshold value, assigning the new call to a given proxy of the group of proxies based on a round robin protocol; and

if the call volume is above the threshold value, assigning [[a]] the new call to the given proxy of the group of proxies based upon the weight; weights assigned to each proxy, wherein the proxies implement the SIP protocol; and

~~distributing a traffic load to one of the plurality of downstream proxies based in part on the weight of at least one of the downstream proxies.~~

11. (cancelled)

12. (currently amended) The method of claim [[11]] 10 wherein the messages sent to the proxies ~~[[is an]]~~ are a SIP INVITE message.

13. (currently amended) A system for load balancing, the system comprising:
a plurality of proxies, wherein the proxies implement the SIP protocol; and
a control node coupled to the plurality of proxies, the control node receiving ~~Voice over Internet Protocol (VoIP) messages from users~~ a new call from a user on a network, the control node including a threshold call load value, the control node including a table of weights, each of the weights associated with one of the plurality of proxies, the weights determined ~~by VoIP information including~~ in part by a delay time between the control node and the proxies ~~received by the control node from the proxies and also in part on a pre-weighting of at least one of the downstream proxies in the list,~~ the control node determining that call volume is above the threshold call load value and distributing the new call to a proxy of the plurality of proxies that has the lowest weight. ~~distributing a traffic load to one of the plurality of downstream proxies~~

~~based in part on the weight of each of the downstream proxies and monitoring the load on the proxies by querying specific processes of the proxies;~~

~~a location server coupled to the control node, the location server directing the messages received by the control node to the proxies; and~~

~~wherein the proxies implement the SIP protocol.~~

14-15. (cancelled)

16. (currently amended) The system of claim 13 wherein the ~~Voice over Internet Protocol (VoIP) messages received by the control node~~ further includes a loading of the proxies control node receives messages from each respective proxy of the plurality of proxies, each message indicating the loading of the respective proxy, and wherein the weights for the respective proxy is also based on the loading of the respective proxy.

17-25. (cancelled)

26. (new) A method, performed by a control node, for the control node to distribute load to a first and second proxy, wherein the control node includes a threshold value, the method comprising:

transmitting a first message to the first proxy, receiving a first reply from the first proxy, wherein the first reply is in response to the first message, and determining a first delay time between the transmitting of the first message and the receiving of the first reply;

transmitting a second message to the second proxy, receiving a second reply from the second proxy, wherein the second reply is in response to the second message, and determining a second delay time between the transmitting of the second message and the receiving of the second reply;

assigning weights to the first proxy and the second proxy based on the first delay time and the second delay time, respectively;

receiving incoming calls;

if a current call volume is below the threshold value, assigning the incoming calls to the first proxy and the second proxy based on a round robin protocol; and

if the current call volume is above the threshold value, assigning the incoming calls to the first proxy and the second proxy based on their respective weights.

27. (new) The method of claim 26, wherein the first message and the second message are INVITE messages.

28. (new) The method of claim 27, wherein the first message and the second message are bad INVITE messages, and wherein the first reply and the second reply are REJECT messages.

29. (new) The method of claim 26, wherein the control node assigns weights to the first proxy and the second proxy also based on a pre-weighting of the first proxy and the second proxy.

30. (new) The method of claim 26, further comprising:
querying a first process on the first proxy; and
querying a second process on the second proxy, wherein the control node assigns weights to the first proxy and the second proxy also based information gathered from querying the first proxy and the second proxy.

31. (new) The method of claim 6, wherein the load information received from each of the plurality of downstream proxies is determined by querying a process at each respective proxy.

32. (new) The method of claim 8, wherein the load information received from each of the plurality of downstream proxies is determined by querying a process at each respective proxy.